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Mr. Todd Thompson
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State Water Resources Control Board
901 P Street
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Re: California Farm Bureau Federation's Comments on the State Water Resource Control Board Statewide Program Draft Environmental Impact Report for General Waste Discharge Requirements for Biosolids Land Application

Dear Mr. Thompson:

The California Farm Bureau Federation (CFBF) is a voluntary, private, nonprofit corporation representing more than 78,000 members throughout California. Our members' properties are targeted for the land application of sewage sludge/biosolids that would be permitted under the State Water Resource Control Board's (SWRCB) proposed General Water Discharge Requirements for the Land application of Biosolids (the General Order or "GO"). CFBF, therefore, is concerned that the GO's proposed statewide standards to promote the use of sewage sludge as a fertilizer/soil amendment neither adequately address the long-term viability of effected agricultural properties nor sufficiently protect the public's health and safety.

The Draft Environmental Impact Report (DEIR) states the GO improves upon the minimal standards developed by the U.S. Environmental Protection Agency (USEPA) at 40 Code of Federal Regulations Part 503 (Part 503) by including more stringent land application controls.[1] Yet the GO and supporting DEIR still primarily rely on the Part 503 regulations and underlying USEPA risk assessment for determining which of the many contaminants in sewage sludge should be regulated and at what levels.[2] On the other hand, the DEIR acknowledges there is significant disagreement in the scientific community over the validity and completeness of the USEPA's risk assessment, particularly its incomplete analyses of long-term effects on soils and crops.[3] Much of

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[1] Draft Environmental Impact Reporting Covering General Waste Discharge Requirements for Biosolids Land Application dated June 28, 1999 (**hereinafter "DEIR"**), p. ES-16.

[2] DEIR, p. ES-7 and App. A, GO, p. 9.

[3] DEIR, pp. ES-15, 16.

the disagreement arises from recognized deficiencies in the USEPA's analyses, mostly due to the lack of necessary information, but also the result of policy decisions that bear more on making sewage sludge use economically feasible for dischargers than to protect the public health.

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In developing statewide regulations for the land application of sewage sludge, the SWRCB was faced with choosing between two policy directions. The first, favored by the USEPA, presumes that a lack of data or other information means no problems exist and the most permissive regulatory standards can be adopted (e.g., potential contaminants or pollutants in sewage sludge, such as fluoride or PCBs, for which the USEPA lacked data, are not regulated).

The second policy favors a more cautious approach. This policy choice acknowledges the growing (not diminishing) scientific controversy regarding the USEPA's Part 503 analyses and assumptions and recognizes the legitimate concerns about the lack of sufficient long-term data, and the difficulty in predicting the possible long-term effects and consequences on agriculture and the public health. Adoption of this more cautious policy would require the implementation of more conservative and protective regulatory standards, emphasize collection of data to evaluate whether assumptions underlying the regulations are valid and, when the data indicates that less stringent controls still would provide the necessary level of protection, only then permit the loosening of the regulatory standards.

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Unfortunately, the GO adopts, and the DEIR supports with little discussion, the USEPA's "full speed ahead, worry about the consequences later" policy. CFBF disagrees with that policy choice, especially since agriculture ultimately will be the industry most negatively effected when problems occur. The DEIR does not sufficiently consider that the adoption of a more conservative baseline for regulating sewage sludge constituents, such as the stringent standards adopted by other countries or the 10% (of USEPA levels) recommended by the Cornell Waste Management Institute, might be a better starting point for the regulation of sewage sludge in California.[4] The initial adoption of more protective standards would still allow for less stringent rules to be adopted in the future as they prove justified. On the other hand, if problems arise from the use of the much more permissive USEPA limits, there will be no way to undo the harm caused and, in particular, it will be too late to reclaim the public's trust of products grown using sewage sludge.

A glaring example of the GO and DEIR's favoring the USEPA's "full speed ahead" policy is the exclusion from regulation, without any scientific basis, of so-called "exceptional quality" (EQ) sewage sludge. Unless EQ sewage sludge otherwise is

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[4] "The Case for Caution—Recommendations for Land Application of Sewage Sludges and an Appraisal of the US EPA's Part 503 Sludge Rules," Cornell Waste Management Institute, Working Paper August 1997; revised 1999 (**hereinafter "The Case for Caution"**).

subject to local regulation, the application of EQ sewage sludges, below the arbitrarily adopted application limits provided in the GO, may go virtually unregulated by either the state or the USEPA with no collection of long-term data for future analysis to verify whether the EQ sewage sludge exclusion is valid. Further, a plausible result of the EQ sewage sludge exclusion, particularly when considering the economics of sewage sludge generation and the incentives for maximizing rather than minimizing application rates and amounts, could be a significant shift to unregulated applications with unknown environmental and public health consequences. Exemptions for EQ sewage sludge use based on content or parcel size are premature until more data is collected and further research conducted regarding the land application of sewage sludge in California.

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The deficiencies identified in the USEPA's Part 503 analyses and the lack of knowledge and understanding of long-term effects and consequences of continued sewage sludge use on agricultural lands demands the selection and implementation of a policy of caution. The GO and supporting DEIR fail to address these valid and relevant issues and therefore both must be redrafted to properly address these concerns.

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I. THE USEPA'S PART 503 REGULATIONS DO NOT PROVIDE A SUFFICIENT BASIS FOR PROTECTING CALIFORNIA'S AGRICULTURAL LANDS AND THE PUBLIC HEALTH.

There is no dispute that the Part 503 regulations provide only "minimal national standards for the use or disposal of biosolids."[5] For example, the USEPA excluded iron and fluoride from regulation despite both elements having critical pathways for public health effects. The reason? Simply because the USEPA could not find any information on the uptake by crops of either element from sewage sludge. The USEPA therefore decided that since the relevant exposure pathways could not be evaluated with the existing information, the elements would not be regulated:

> Not all of the pollutants were assessed for each pathway, however, because some pollutants were screened out by incremental ranking. Although fluoride and iron were not screened out, they were not evaluated in the risk assessment for the final rule. . . Both iron and fluoride were dropped early in the risk assessment, because the effects of each were based on single anomalous studies in which the concentration of the pollutant was very high relative to "normal sludge" and because insufficient data were available on which to base a risk assessment.[6]

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[5] "A Plain English Guide to the USEPA's Part 503 Biosolids Rule," EPA/832/R-93/003 (Sept. 1994), p. 16.

[6] "Technical Support Document for Land Application of Sewage Sludge, Volume 1," EPA 822/R-93-001a. November 1992, pp. 4-5.

Obviously, the USEPA just as easily could have concluded that in absence of evidence, but knowing detrimental effects were a possibility, it would be better to err on the side of safety and impose some protective standards until more information could be collected. As the Cornell Waste Management Institute points out, "[i]t is questionable whether it is reasonable to assume little transfer to animals and soil biota given the absence of data."[7] The problem is that once the USEPA decided not to regulate a particular contaminant, there may be no incentive for scientists to perform the research necessary to verify the USEPA's determination, especially within the USEPA!

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Similarly, the synergistic effect of multiple metals together in the soil was not considered by the USEPA, yet could be a significant problem.[8] In addition, the National Academy of Sciences has criticized the USEPA's assumptions for excluding the regulation of organic chemicals in sewage sludge from its Part 503 regulations:

> While the probability that the compounds would affect human-consumed crops is very low, the potential for human exposure to these chemicals through other pathways as defined in the Part 503 rule should be re-evaluated. . . .
>
> The EPA should not exclude chemicals from regulatory consideration based solely on whether or not those chemicals have been banned from manufacture in the United States (e.g., PCBs) since they are still found in sludges from many waste water treatment plants.[9]
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> In Chapter 7, questions were raised about EPA's approach to screening toxic organic pollutants and their exemption from regulation. While the committee concluded that these organic pollutants in sludge were not likely to present a risk to consumers of food crops, public concerns have been raised by the fact that even a small percent of sludges have concentrations of certain pollutants (e.g., PCBs) that exceed a risk-based limit of acceptability. In addition, it is difficult for the public to understand

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[7] "The Case for Caution," p. 21.

[8] Wallace and Wallace, "A Possible Flaw in EPA's 1993 New Sludge Rule Due to Heavy Metal Interactions," Commun. Soil. Sci. Plant Anal, 25(1&2), pp. 129-135 (1994).

[9] National Academy of Sciences, National Research Council, Committee on the Use of Treated Municipal Wastewater Effluence and Sludge in the Production of Crops for Human Consumption, "Use of Reclaimed Water and Sludge in Food Crop Production," National Academy Press, Washington, D.C. 1996 (**hereinafter the "NAS Study"**), pp. 7-8.

> that the application of sludge on cropland is safe when ocean dumping of sludge is prohibited . . . .[10]

The NAS also noted other deficiencies in the USEPA's analysis, including the possible presence of, and public health risks associated with, radioactive materials in wastewater effluents and sewage sludge:

> Other questions have been raised about the safety of wastewater effluents and sludge. A recent report by the General Accounting Office (1994) dealt with the presence of radioactive material entering sewage treatment plants and the lack of regulatory action on this issue. This committee has not delved into that particular issue or other issues involving the quality of municipal wastewater, but it is possible that such concerns will arise when a POTW elects to recycle wastewater or sludge on cropland. Addressing such concerns about sludge requires convincing scientific analysis showing that adequate safeguards are being applied.[11]

More fundamentally, the USEPA has been criticized for its policy decision to lower the health risk standard for sewage sludge from the originally proposed limit of 1 in 1,000,000 to 1 in 10,000, a hundred fold decrease in the safety factor.[12] The USEPA did not provide evidence to support this policy change, except for the bare assertion that a lower safety factor was sufficient because so few people nationally are at risk (not much comfort to the farmers using the product) and because the higher standard might prevent some POTWs from land applying their sewage sludges (certainly not a safety consideration).[13] For a number of the contaminants the USEPA evaluated, however, cancer risk was determined to be the most significant risk from the use of sewage sludge. This change in policy resulted in the USEPA increasing the permissible levels of contaminants in sewage sludge. As the Cornell Waste Management Institute notes, a cancer risk higher than 1 in 10,000 is typically used in setting regulations and in many regulatory contexts (e.g., drinking water regulation), a risk of one excess cancer in 1 million people exposed is used to establish the standards.[14]

Finally, when it published the Part 503 regulations in 1993, the USEPA recognized there were uncertainties considering the long-term behavior of metals and sludge. For example, the USEPA noted that it is possible that when the organic

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[10] NAS Study, pp. 161-2.

[11] NAS Study, pp. 161-2 (emphasis added).

[12] DEIR, p. 5-30.

[13] "A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule," EPA832-B-93-005 (September 1995), p. 111.

[14] "The Case for Caution," p. 15.

component of sludge breaks down, the average concentrations of pollutants may increase or become more bioavailable.[15] This is precisely the conclusion drawn by Dr. McBride in his study "Toxic Metal Accumulation from Agricultural Use of Sludge: Are USEPA Regulations Protective?"[16]

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The bottom line is that there are no reasonable bases for simply accepting the generic, data deficient and policy subject recommendations of the USEPA in developing realistic and necessary regulatory standards for the use of sewage sludge on agricultural lands in California. The DEIR therefore is deficient in failing to analyze and determine whether: (1) additional contaminants and pollutants should be regulated, in particular whether the absence of data necessitates setting more protective standards until more data can be collected; (2) higher cancer risk standards are warranted based upon California-specific air and water quality standards; and (3) additional safety factors and further studies are needed considering the scarcity of knowledge about the long-term effects of using use of sewage sludge on agricultural lands.

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II. THE DEIR IMPROPERLY ASSUMES THAT SINCE PUBLISHED ACCOUNTS OF PUBLIC HEALTH ISSUES ASSOCIATED WITH SEWAGE SLUDGE USE WERE NOT FOUND, THE USEPA'S LESS CONSERVATIVE REGULATIONS ARE ACCEPTABLE.

In response to previously raised concerns about potential environmental impacts resulting from the use of sewage sludge on agricultural lands, including comments supported by scientific papers referenced therein, the DEIR's general response is that a review of the literature found little evidence of any public health problems or damage resulting from the use of sewage sludge.[17] CFBF disagrees with the DEIR's presumption that the lack of published reports is a sufficient basis for ignoring this critical issue and downplaying the need for more conservative regulation of sewage sludge.

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First, and perhaps most important, the widespread availability of sewage sludge for land application purposes did not begin until the USEPA issued its Part 503 regulations in 1993. Hence, it is not surprising that little data has been collected and reported concerning public health or soil/crop effects resulting from long-term use of sewage sludge. There simply has not been sufficient time or volume of usage to generate such data and publish such reports. As the USEPA has acknowledged, with regard to the crucial determination of phytotoxicity effects on crops, the USEPA lacked data on long-term effects, so "[s]hort-term experiments were used to develop a plant

[15] Federal Register, February 19, 1993, pp. 9273-9274.

[16] Journal of Environmental Quality, Vol. 24, No. 1, January-February, 1995.

[17] DEIR, pp. 5-26, 27.

concentration of pollutants associated with phytotoxicity . . . ."[18] Further, the Cornell Waste Management Institute found:

> Excessive accumulation of certain metals, such as copper, zinc and nickel reduces crop yields. We need to assess not only short-term benefits, but long-term risks of yield reduction due to accumulation of contaminants over time. This pathway (Pathway 8, Table 3) was evaluated by USEPA in the risk assessment and has also been considered by agronomists at the land grant universities in the northeast (Pennsylvania State University, 1985). The cumulative limits for copper, nickel and zinc in the Part 503 regulations are approximately 10 times those recommended by the northeast soil scientists.[19]

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The DEIR references a study of sewage sludge use on Ohio farms as support for the conclusion that there are (or will be?) no human or animal health effects from sewage sludge use.[20] However, the authors of the Ohio study included disclaimers against using the study's results for such purposes. During the course of the Ohio study, a significant number of the participants dropped out and many commentators have questioned its usefulness. It also is interesting to note that the application rates used in the study, 2-10 dry metric tons/hectare/year, or approximately 0.9-4.4 tons/acre, may be far lower than typical application rates permissible in the GO.[21]

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The DEIR then acknowledges that "no subsequent studies have been performed because the risks were deemed to be low and the costs for such studies are very high."[22] Reliance on a 14 year old study, performed eight years before the release of the Part 503 regulations, and whose conclusions are suspect should indicate that new studies are needed before "minimal" standards are blindly adopted. The lack of information on long-term soil effects from the build-up of hazardous materials and pathogens in sewage sludge and the transference of those contaminants and pollutants into crops and animals warrants a cautious approach towards the regulation of sewage sludge. This approach requires the use of conservative assumptions and standards until more information is collected, not the adoption of permissible standards favored by sewage sludge generators for economic reasons which may result in future problems that will be too late to fix.

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[18] Risk Assessment, p. 5-197, 5-201.

[19] "The Case for Caution," Cornell Waste Management Institute, p. 25.

[20] DEIR, p. 5-27, 5-33..

[21] DEIR, p. 5-26.

[22] DEIR at p. 5-27.

III. THE DEIR FAILS TO ADDRESS THE PROBLEM OF ACCURATELY DETERMINING MINERALIZATION RATES NECESSARY FOR THE CALCULATION OF APPROPRIATE SEWAGE SLUDGE APPLICATION RATES.

An important element in the calculation of the appropriate agronomic application rates for sewage sludge is the determination of the relevant mineralization rate. Although the DEIR recognizes that the failure to calculate the proper mineralization rate could result in inaccurate agronomic rate determinations and possible impacts on groundwater, the DEIR determines that no mitigation is necessary because the GO prohibits such results and requires management practices to ensure compliance.[23] The GO, however, does not require mineralization rates be provided to the SWRCB for its review .[24] Yet mineralization rates for sewage sludges are highly variable, which increases the risks of overapplication. This issue was addressed by the USEPA in its 1995 Process Design Manual for sewage sludge use:

> Site-specific data or the best judgment of individuals familiar with the N dynamics of the soil-crop system at the site should always be used in preference to "typical" values. Particularly for large-scale projects, laboratory mineralization studies should be considered . . . using samples of the actual sewage sludge to be applied and soil materials from the site, because application rate calculations are quite sensitive to the assumed annual N mineralization percentage used.[25]

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The USEPA goes on to discuss the problems with providing accurate estimates of mineralization rates and the variety of factors that influence mineralization rates, including the amount of nitrogen carried over into future years:

> These values . . . can vary significantly due to differences in the characteristics of the sewage sludge, soil, and climate (i.e., temperature and rainfall). For example, assuming adequate moisture is available for microbial decomposition, increases in temperature will increase the activity of microorganisms. Therefore, mineralization rates are typically higher in the summer months than in the winter months and higher in the southern U.S. than in the northern states. . . .[26]

[23] DEIR, pp. 3-30, 31.

[24] DEIR, App. A, GO Pre-Application Report, pp. 2-3.

[25] EPA Process Design Manual: "Land Application of Sewage Sludge and Domestic Sludge", EPA/625/R-95-001, September 1995, p.69 (emphasis added).

[26] EPA Process Design Manual: "Land Application of Sewage Sludge and Domestic Sludge", EPA/625/R-95-001, September 1995, p.73.

In addition to weather conditions, the method of sewage sludge processing and application, the length of time sewage sludge remains on the soil surface prior to incorporation, the soil type and moisture content as well as the pH of the sewage sludge also will influence the mineralization rate.[27]

The SWRCB's failure to require in the GO that mineralization rate information and calculations be provided and regulatory approval be required before applications are permitted is a significant deficiency that requires mitigation. This is particularly important since if lower than actual mineralization rates are used, overapplications of sewage sludge may result. Further, application rates for typical fertilizer products are irrelevant to the determination of appropriate agronomic application rates for sewage sludge.

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IV. THERE IS NO EVIDENCE TO SUPPORT ANY EXEMPTIONS FOR CLASS A EXCEPTIONAL QUALITY (EQ) SEWAGE SLUDGE.

The wide-spread availability of sewage sludge for land application purposes did not begin until the USEPA issued its Part 503 regulations in 1993. The classification of Class A EQ sewage sludge was not even defined in the Part 503 regulations, but appeared later, in subsequently published guidance documents. The USEPA provided very little evidence to support its determination that Class A EQ sewage sludge should be exempt from most of the administrative requirements and application limitations imposed on non-EQ sewage sludge. Most of the land applications of sewage sludge that have been permitted since the Part 503 regulations were issued primarily have involved non-EQ sewage sludges. Hence, as noted earlier, it should come as no surprise that little data has been collected and reported concerning environmental effects of Class A EQ sewage sludge use since there simply has not been sufficient time or volume of usage to generate such data and publish any reports. It therefore is premature to assume that because no such data has been published, it must mean that Class A EQ sewage sludge is as completely safe as the USEPA presumed. Past experience with other products purported to be beneficial for agricultural use have demonstrated that only after wide-spread use has begun and sufficient time has elapsed have problems become apparent, e.g., the introduction and later ban of DDT, etc.

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Further, there is no justification for finding that Class A EQ sewage sludge is so different from non-EQ sewage sludge that most of the USEPA regulations or any of the GO requirements for the land application of sewage sludge do not or should not apply.

[27] EPA Process Design Manual: "Land Application of Sewage Sludge and Domestic Sludge", EPA/625/R-95-001, September 1995, p.74 and EPA Land Application of Sewage Sludge: A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge. 40 CFR Part 503", EPA/831-B-93-002b, December 1994, Appendix E-1.

CFBF finds no rationale for excluding Class A EQ sewage sludge from the GO requirements for non-EQ sewage sludge use, particularly as they pertain to limiting heavy metals concentrations in soil or imposing agronomic rate requirements.

EQ and non-EQ sewage sludges are subject to the same instantaneous ceiling concentration limits for heavy metals.[28] The only difference between EQ and non-EQ sewage sludges are that, when calculated on a monthly average basis, the heavy metals content of EQ sewage sludges are limited to between one third to one half of the heavy metals concentrations allowed in non-EQ sewage sludges. One exception is Nickel, for which EQ and non-EQ sewage sludges have the identical pollutant limits.[29] An obvious concern with relying on self-determined, infrequently calculated averages is that some loads of EQ sewage sludge produced during a particular month may contain heavy metals that exceed the average, and may reach levels equivalent to non-EQ sewage sludge.

Although the USEPA, in guidance documents issued subsequent to the release of the Part 503 regulations, seems to indicate EQ sewage sludge could be exempt from non-EQ sewage sludge regulations and controls (e.g., buffer zone restrictions, metals concentrations in soil, etc), the USEPA provided no evidence to support this idea. A particular problem with the USEPA's purported waiver of regulatory and administrative controls for EQ sewage sludge has to do with agronomic rate requirements. Agronomic rate limits for non-EQ sludge are designed to limit the amount of nitrogen applied to the land for the purpose of preventing excess nitrogen from leaching into surface waters or groundwater. Since the nutrient content of EQ and non-EQ sludges are similar, it makes no sense to permit the uncontrolled land application of EQ sewage sludge.

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Further, the same heavy metals are present in EQ and non-EQ sewage sludges and these metals will build up in the soil with continued applications regardless of the sewage sludge classification. If agronomic rates are not followed and enforced for EQ sewage sludge applications, allowing application rates that exceed those for non-EQ sewage sludge, metal deposition rates on agricultural lands may approach that of non-EQ sewage sludge. Since one of the basic premises of the USEPA's Part 503 regulations is that sewage sludge applications eventually may lead to harmful levels of heavy metals concentrations in soil, and as the same metals are present in EQ as in non-EQ sewage sludges, CFBF finds no rationale for waiving the regulatory and administrative controls imposed on non-EQ sewage sludge for EQ sewage sludge.

Finally, the application rate and parcel size provisions defining the EQ sewage sludge exemption in the GO are completely arbitrary and without any evidentiary support. Pursuant to these provisions, as long as applications of EQ sewage sludge

[28] 40 CFR 503.13 (table 1).

[29] 40 CFR 503.13 (table 3).

mixtures, where sewage sludge makes up less than 50% of the total, remain below 20 tons/acre, there are no limits on the number of acres that could be so used, and no requirements to comply with the GO's requirements. (EQ sewage sludge may be "created" by mixing and composting sewage sludge with green waste, thereby converting the entire mixture into sewage sludge.) Yet the GO goes on to note that "public acceptance of large scale uses [of EQ] has indicated the need for oversight at this time."[30] Of particular importance is that the only data presented in the DEIR regarding typical application rates for agricultural uses in California is 2-10 dry metric tons/acre/year (approximately 0.9-4.4 tons/acre).[31] What then is the justification for permitting EQ sewage sludge to be applied at unregulated rates up to 20 tons/acre? This simply demonstrates the fallacy of the EQ sewage sludge exemptions in the GO and why they must be deleted.

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V. Monitoring Requirements.

The GO and DEIR provide for little in the way of post-application monitoring/soil testing or collection of data for analysis of long-term effects. Yet without this information, it will be extremely difficult to later determine whether environmental damage, if it occurs, is the result of sewage sludge applications. A plan for post application soil sampling and monitoring and ongoing data evaluation must be incorporated into the GO. Currently, 40 CFR 503 requires only a self-regulated "paper-tracking" program in which the treatment facility generates and gives the applicator a piece of paper that states the metals content of its sewage sludge, the applicators pass that piece of paper to the farmer, and the farmer then adds the listed metal values to the metal values of prior applications. There are no requirements that this "paper tracking" system ever be verified by analyzing an actual soil sample. It therefore seems reasonable to require, at some point in the application process, e.g., sometime during the permit cycle, that soil sampling be conducted to determine whether the paper tracking of the 40 CFR 503 listed metals match the actual buildup of those metals in the soil. If successful, post application soil sampling will help to alleviate concerns regarding the self-regulatory aspects of Part 503. However, if soil sample results are higher than the paper tracking process indicates, post application soil testing would allow this problem to be rectified at an early stage.

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VI. OTHER ISSUES.

Briefly, CFBF notes a few other deficiencies in the GO and DEIR. First, the DEIR Mitigation Measure 5-2 extends the GO's grazing restriction period following Class B sewage sludge applications to 60-90 days from the GO's 30 day prohibition. The DEIR provides no scientific references for this determination. On the other hand, the National

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[30] DEIR, App. A., GO, p. 2.

[31] DEIR, p. 5-27.

Academy of Sciences noted a recent investigation in Denmark which indicated beef tapeworm eggs could survive in sludge-treated fields for up to one year.[32] The NAS therefore recommended the USEPA reevaluate the 30 day waiting period.[33] Based on this data, the DEIR mitigation measure is to permissive, and a one year prohibition should be imposed until more studies have been conducted.

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In addition, although the DEIR notes that the use of sewage sludge as final cover for landfills is a "use," not a disposal method, the DEIR fails to mention or analyze whether the use of sewage sludge as daily cover for landfills is a viable alternative to land applications. Using sewage sludge as daily cover would minimize the use of clean fill for that purpose and not effect landfill diversion goals.

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VII. CONCLUSION.

The lack of necessary data, combined with the USEPA's acknowledgment that long-term usage of sewage sludge can impact soil and crops, demonstrates that caution in the use, control and oversight of sewage sludge applications on agricultural properties is necessary. A cautious approach requires re-evaluation of the USEPA's Part 503 analyses, assumptions and policy choices and an unbiased examination of whether different, more protective policies should be followed for land applications in California. A cautious approach also requires independent monitoring and testing of the sewage sludge to verify quality and mineralization rates, and implementation of long-term monitoring and testing of soil and crops grown using sludge. Only in this manner can sufficient data be collected to verify whether the USEPA's approach is sufficiently protective of agricultural properties and the public health to warrant the use of its more permissive standards in the future. The GO and DEIR therefore must be redrafted in order to sufficiently address these issues and to provide more reasonable and appropriate findings and recommendation.

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Sincerely,

RONALD LIEBERT

RL:pkh

[32] NAS, p. 4.

[33] NAS, pp. 4-5.

50-1. The commenter's concerns about the land application of biosolids and the Part 503 risk assessment are noted.

50-2. The SWRCB is using, as a base for the proposed regulatory process, EPA-based science developed for its regulations. The decision to use that approach over the method used on other continents such as Asia or Europe or the Cornell's Waste Management Institute's 10% value policy is because of the fact that EPA's limits are based on peer reviewed scientific methodology. Those standards are the current national standards used in many other state regulations. Also, see Master Response 12 and Responses to Comments 28-17, 37-2, and 37-3.

50-3. The comment criticizes the Part 503 regulations for not regulating "exceptional quality" (EQ) biosolids. The proposed GO does regulate the use of biosolids to protect the public and the environment. The quality and parcel size restrictions related to reuse of EQ biosolids are considered conservative and fully protective.

The proposed GO does not exempt the required reporting for compliance with the federal program, but potentially adds oversight restrictions for such applications at the point of application (site). The applicability restrictions in the proposed GO are established using best professional judgment. The loading requirement is based on published technical resources and communications with industry representatives regarding standard market applications of EQ biosolids. The operation size is based on the state's experience with regulatory oversight and enforcement. EQ biosolids includes materials sold in the composting and agricultural mineral markets, including the bagged compost homeowner market. Entities in such markets can and do sell their products in bulk for large landscaping projects at public areas and private residences. The need to address environmental issues associated with these products (or materials closely resembling these products) is not substantiated and may have an adverse impact on such commercial uses and markets. Such activities should be addressed site-specifically. Also see Responses to Comment 21-67a.

50-4. Refer to Response to Comment 50-1. SWRCB staff believes the conservative nature of the proposed GO represents a policy of caution regarding land application of biosolids.

50-5. There is no research that confirms that iron and fluoride in biosolids are a risk to humans or the environment. The Cornell study also does not provide any conclusive scientific evidence that iron and fluoride are a concern with biosolids land application.

50-6. No definitive biosolids land application studies show negative synergistic effects of combinations of pollutants. There are, however, studies that have shown positive synergistic effects from combinations of metals and other pollutants. Studies indicate that the presence of zinc suppresses the uptake of cadmium. Another example is the

bioavailability of cadmium, selenium and molybdenum can be reduced due to the presence of calcium, iron, and zinc. No conclusive scientific evidence is available to confirm any negative synergistic effects of multiple metals together in the soil resulting from biosolids applications.

EPA chose not to regulate PCBs because the levels found in biosolids are hundreds to a thousand times lower than the regulatory limit of 50 ppm used in the Resource Conservation and Recovery Act (RCRA). The risk assessment also showed minimal risk to public health and the environment. POTWs still continue to monitor for PCBs and continue to find low levels of PCBs consistent with EPA's results.

Ocean dumping of biosolids was banned primarily because the added nutrients from biosolids cause increased algae production, which leads to oxygen depletion at the discharge site. These same nutrients are what make biosolids beneficial for land application.

50-7. See Response to Comment 44-3.

50-8. SWRCB staff is aware of the controversy surrounding the EPA risk assessments that supported development of the Part 503 regulations. However, SWRCB staff believes the pathway analyses were conducted with very conservative assumptions and the proposed GO provides protection beyond that contained in the federal regulation.

50-9. There is no conclusive scientific evidence that shows that the metals bioavailability or concentrations in biosolids increase as the biosolid's organic component breaks down. Hyun et al. 1998, concluded that "There was no indication that soluble Cd concentration or the phytoavailability of Cd in the sludge-treated soils increased as the organic C in these soils declined over the 10 years following termination of sewage sludge application."

50-10. EPA's past work, as well as current scientific information, was reviewed to determine the applicability of the standards. No conclusive scientific information was found that would change any of the standards. The concerns of Cornell's "Case for Caution" report were evaluated and are also subject of scientific debate. The science-based approach taken by EPA, which uses decades of research and agreement among qualified researchers, provides sufficient reason for the proposed GO to use EPA standards as a base. Furthermore, the proposed GO provides additional conservative measures that are more restrictive (See Master Response 12).

50-11. SWRCB staff believes that the studies of phytotoxicity conducted in support of the Part 503 regulations are adequate to allow continued use of biosolids on agricultural land as long as the strict controls in the proposed GO are implemented. Biosolids have been applied to soils and crops in California for a much longer time than the 1993 date indicated in the comment. There is no evidence of significant phytotoxicity or human health hazards being caused by land application of biosolids. Nonetheless, because of concerns expressed in comments on the draft EIR regarding metals toxicity, the SWRCB staff has modified

Mitigation Measure 4-1 to require a preapplication stage review of project-specific soils and biosolids metals levels and proposed crops to minimize the risks of phytotoxicity or bioaccumulation of metals in certain crops.

50-12. See Responses to Comments 43-49 through 43-52 and Master Response 18.

50-13. The concerns expressed are acknowledged and addressed throughout the draft EIR and Response to Comments (See Master Response 13 regarding use of the EPA risk assessments for water quality). This same description of how the information was used and the rational for using the Part 503 regulations risk assessments and regulations as a basis for the proposed GO apply to the commenter's concern. Conservative assumptions were used in the risk assessments conducted by EPA. The proposed GO includes additional prohibitions and restrictions that are more conservative than the federal Part 503 regulations alluded to in Master Response 13. SWRCB staff does not consider its proposed GO to be a "minimal" standard.

The science used in developing the Part 503 regulations has been well-documented. These regulatory limits are adequate minimum standards to protect public health and the environment. The proposed GO requires extensive pre-project data and subsequent monitoring data to show that water quality and public health are being protected. The proposed GO provisions are not permissive (sic) standards favored by the sludge generators. They represent an independently derived set of minimum requirements that protect various beneficial uses. More restrictive conditions can be applied in individual permits for land application if dictated by site conditions. The proposed GO is adequate to protect beneficial uses in most situations.

50-14. Comment noted. See Responses to Comments 7-2 and 16-35.

50-15. See Responses to Comments 50-3 and 8-4.

50-16. See Responses to Comments 21-91 and 37-2.

50-17. See Master Responses 7 and 8. It is also noted that the NAS report did not specify a time frame that would replace the 30-day waiting period. The NAS merely indicated that the issue needs to be reevaluated based on the single study cited in Denmark.

50-18. The environmental effects of using biosolids as a daily cover at landfills would not be substantively different from the effects of its use as final cover, except that a much greater volume of the material could be directed to landfills as daily cover. The environmental implications of directing more material to landfills as opposed to land application are addressed in the Land Application Ban Alternative section of Chapter 14 (beginning on page 14-13 of the draft EIR). This alternative is considered a viable one in the EIR. It is agreed that use of biosolids as daily cover would reduce the need for clean fill at landfills.

50-19. Refer to responses to Comments 50-1 through 50-18. It is SWRCB's position that the proposed GO does represent a more conservative approach for protection of public health and soil resources when compared to the Part 503 regulations. The technical analyses in the draft EIR are an unbiased examination of the combination of federal and state regulations of biosolids land applications. If ongoing scientific research, soils and water testing, and public health records indicate the proposed GO is not adequately protective, the SWRCB will adjust the conditions in the proposed GO as deemed appropriate.